Amendment to the Claims:

1. (Currently Amended) A pump comprising:

~~a housing, having an inlet and an outlet,~~

a drive,

a fixed cylinder with a mid-axis, the fixed cylinder being connected with an inlet and an outlet;

a displacer ~~rotating~~ planetating eccentrically within the fixed cylinder,

a crank drive ~~for~~ connected with the drive and the displacer,

a circumferential sickle-shaped pumping chamber [[)]] defined between the cylinder and displacer, and

a helical sealing element supported on the displacer in the pumping chamber,

the pump being a dry vacuum pump, whereby the displacer ~~circulates~~ planetates in the cylinder without making contact with the cylinder.

2. (Previously Presented) The pump according to claim 1, wherein the smallest distance between the displacer and an inside wall of the cylinder does not exceed 1 mm.

3. (Currently Amended) The pump according to claim 1, wherein the cylinder is a component of ~~the~~ a pump housing.

4. (Previously Presented) The pump according to claim 1, wherein the displacer defines a hollow space.

5. (Previously Presented) The pump according to claim 4, wherein a cooling gas flows through the hollow space.

6. (Previously Presented) The pump according to claim 1, wherein means are provided which prevent turning of the displacer about the mid-axis of the cylinder.

7. (Previously Presented) The pump according to claim 1, wherein means are provided which prevent turning of the sealing element about the mid-axis of the cylinder.

8. (Previously Presented) The pump according to claim 1, wherein an outside wall of the displacer is equipped with a helical groove for the sealing element.

9. (Previously Presented) The pump according to claim 8, wherein the helical sealing element has, in the relaxed state, an outside diameter which is greater than an inside diameter of the cylinder.

10. (Previously Presented) The pump according to claim 1, wherein the inside wall of the cylinder is equipped with a helical groove for the sealing element.

11. (Previously Presented) The pump according to claim 10, wherein the helical sealing element, in a relaxed state, has an inside diameter which is smaller than an outside diameter of the displacer.

12. (Previously Presented) The pump according to claim 8, wherein the sealing element exhibits, in the area of the groove, approximately radially oriented sealing lips.

13. (Currently Amended) The pump according to claim 8, wherein the sealing element includes ~~in the area of its unoccupied side face~~ a substantially axially orientated sealing lip [[(71)]] in a side face thereof.

14. (Previously Presented) The pump according to claim 8, wherein two or more grooves are provided as a double or multiple thread as well as a corresponding number of sealing elements.

15. (Previously Presented) The pump according to claim 8 wherein a pitch of the groove from the inlet to the outlet decreases.

16. (Previously Presented) The pump according to claim 15, further comprising a relief valve which is located between the inlet and the outlet.

17. (Previously Presented) The pump according to claim 1, further comprising a rotary system with a crank, the crank being driven by the drive via a shaft, said rotary system with the crank supporting the displacer via bearings.

18. (Previously Presented) The pump according to claim 17, wherein the crank includes two crank sections in bearing pieces, one section on each side of the pump housing, and the rotary system is supported, via bearings, through the two crank sections.

19. (Previously Presented) The pump according to claim 17, wherein one crank section is cantilevered and where the displacer is supported in a cantilevered manner by the crank section.

20. (Previously Presented) The pump according to claim 17, wherein at least one mass balancing weight is part of the rotary system.

21. (Previously Presented) The pump according to claim 20, wherein the displacer includes a hollow space, the mass balancing weight being located in a hollow space.

22. (Previously Presented) The pump according to claim 1, wherein the pump is of a double flow design.

23. (Previously Presented) The pump according to claim 22, wherein the inlet is a central inlet and the outlet includes outlets located on side faces of the housing.

24. (Previously Presented) The pump according to claim 1, wherein the pump is of a two-stage or multi-stage design.

25. (Previously Presented) The pump according to claim 24, wherein the displacer substantially has the shape of a double pot which includes first and second hollow spaces, and wherein bearings of the displacer are located in one of the hollow spaces and a pumping stage is located in the other hollow space.

26. (Previously Presented) The pump according to claim 25, wherein a component is fixed to the housing and projects into the hollow space with a cylindrical outer surface that forms, jointly with an inside wall of the displacer, a further pumping stage.

27. (Previously Presented) The pump according to claim 26, wherein a bore penetrating the component forms the inlet.

28. (Previously Presented) The pump according to claim 24, wherein volumes of pumping chambers in a stage on an intake side are greater than volumes of the pumping chambers of a pump stage on a delivery side.

29. (Currently Amended) The pump according to claim 1, further comprising a gas ballast facility connected with the pumping chamber.

30. (Previously Presented) The pump according to claim 29, wherein the housing is equipped with a bore through which ballast gas is supplied via a line equipped with a valve.

31. (Previously Presented) The pump according to claim 4, further comprising a rotary system, wherein the rotary system is equipped with a system of channels through which the hollow space in the displacer is connected to the surroundings.

32. (Previously Presented) The pump according to claim 31, wherein the displacer is equipped with a bore and wherein the system of channels serves the purpose of supplying ballast gas.

33. (Previously Presented) The pump according to claim 31, wherein the system of channels serves the purpose of supplying cooling air.

34. (Previously Presented) The pump according to claim 22, wherein the displacer includes a hollow space and is equipped with a bore, the system of channels serves the purpose of supplying cooling air, and the outlet is served by a joint discharge bore, a direction of the pumping action of two pump stages being from respective side faces of the housing to the joint discharge bore whereby one of the pump stages serves the purpose of removing the cooling air from the hollow space of the displacer.

35. (Previously Presented) The pump according to claim 1 wherein the helical sealing element consists of a PTFE containing material and the displacer and the housing consist of an aluminium material.

36. (Previously Presented) The pump according to claim 1, wherein one of an outside wall of the displacer and an inside wall of the cylinder is equipped with a helical groove for the sealing element and the rotational speed and eccentricity are so selected that a sliding velocity between the helical sealing element and a side wall of the related groove is between 1 and 5 m/s.

37. (Currently Amended) A method for operating a pump with a housing, having an inlet and an outlet, a drive, a fixed cylinder ~~centred~~ centered on a mid-axis, a displacer~~, rotating~~ disposed to planetate eccentrically within the cylinder, a crank drive for the displacer, a circumferential sickle-shaped pumping chamber between the cylinder and displacer, and a helical sealing element supported by the displacer in the pumping chamber, the method comprising:

operating the pump as a vacuum pump, the pumping chamber being operated free of lubricants and the crank drive guiding the displacer such that it ~~circulates~~ planetates in a non-contact manner within the cylinder.

38. (Previously Presented) The method according to claim 37 wherein the pump is operated with inner compression.

39. (Currently Amended) The method according to claim 37, wherein the displacer includes a hollow space, the method further comprising: maintaining a ~~low~~ vacuum pressure in the displacer.

40. (Previously Presented) The method according to claim 37, wherein the displacer includes a hollow space, the method further comprising: flowing cooling air or ballast gas through the hollow space of the displacer.